

AMENDMENT OF THE DRAWINGS:

Attached are replacement sheets of drawings which reflect changes to FIGS. 1, 2, 3, 4 and 6. The replacement sheet of FIG. 1 replaces the originally-filed drawing sheet of FIG. 1. The replacement sheet of FIGS. 2 and 3 replaces the originally-filed drawing sheet of FIGS. 2 and 3. The replacement sheet of FIG. 4 replaces the originally-filed drawing sheet of FIG. 4. The replacement sheet of FIGS. 6 and 7 replaces the originally-filed drawing sheet of FIGS. 6 and 7. The Replacement Sheets reflect changes to FIGS. 1, 2, 3, 4 and 6 to which have been added the legend "(Prior Art)" as required by the Examiner. No new matter has been added.

Additional drawing sheets containing new FIGS. 10 and 11 are attached. Support for the drawings of FIGS. 10 and 11 is found on page 3, line 26, through page 4, line 1 (paragraph [0015] of the attached substitute specification) and in claims 9-10 as originally filed. No new matter is added.

**REMARKS**

The Office Action mailed October 10, 2006 has been received and reviewed. Claims 1 and 3-16 are pending. Claims 1 and 3-16 are rejected over cited references. Claims 1, 4-7 and 12-14 are amended. Claims 3 and 8-11 are cancelled. Claims 17-26 are added. For the reasons stated below, the Applicants submit that the claims distinguish over the cited reference and are in condition for allowance.

**Rejection Of Claims 1 And 3-13 Under 35 U.S.C. § 102(b)**

Claims 1 and 3-13 are rejected under 35 U.S.C. §102(b) as being anticipated by Lee (USP 1,881,723). The rejection is overcome by amendment to claim 1. As amended, claim 1 requires an impeller having a front shroud and back shroud, where one of the two shrouds has a diameter dimension  $D_a$  which is greater than the diameter dimension  $D_a$  of the other shroud. Lee fails to disclose such structure. Lee teaches shrouds that have an equal diameter dimension. Therefore, claim 1 is not anticipated by Lee, nor are claims 4-7, 12 and 13 which depend from claim 1 and include the limitations thereof.

Added claims 17-26 recite an impeller having at least one shroud and auxiliary vanes located on one of the faces of the said at least one shroud, where the auxiliary vanes have an outer edge that is formed with an angle  $Z$  which is not disclosed by Lee. Therefore, added claims 17-26 are not anticipated by Lee.

**Rejection Of Claims 14-16 Under 35 U.S.C. § 103**

Claims 14-16 are rejected under 35 U.S.C. § 103 as being unpatentable over Lee. The Examiner states that Lee discloses all of the claimed subject matter except for the dimensions  $D_b$  and  $D_c$  being within 5% of each other,  $D_b$  being less than  $0.95D_a$ , the ratio of  $D_b/D_a$  being from 0.65 to 0.95, and the ratio of  $D_b/D_a$  being from 0.65 to 0.9. The Examiner states that since the Applicant has not disclosed that having the diameter of the blades and shrouds at the specified dimensions solves any stated

problem or is for any particular purpose above the fact that the ratios reduce wear on the auxiliary blades, and the Examiner states that it appears the blades of Lee would perform equally well having the dimensions as claimed by the applicant, it would have been an obvious matter of design choice to modify the blades and shrouds of Lee by using the specific dimensions as claimed to reduce blade wear. The rejection is traversed.

The instant specification, including FIGS. 4, 6 and 7, demonstrate the significance of structuring an impeller where the auxiliary vanes have a diameter dimension  $D_b$  which is from about 65% to 95% the diameter dimension of the shroud of the impeller. The significance of the claimed dimensional ratios is further addressed in the attached Declaration of Craig I. Walker, an Applicant and inventor of the present invention. Mr. Walker's Declaration fully explains the benefit to impeller service life that is provided by the claimed impeller structure. Providing auxiliary vanes that have a diameter dimension as claimed is not simply a matter of design choice and the significance of the claimed dimension differential is neither recognized nor addressed in the Lee reference.

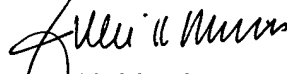
While FIGS. 1 and 2 of Lee illustrate an impeller having auxiliary vanes that have a diameter that is slightly less than the diameter of the shrouds, Lee provides no disclosure or teaching concerning any benefit that may be derived from structuring an impeller with dimensional ratios as claimed. The Lee patent is directed strictly to a pump structured to prevent processed slurry from accessing the stuffing box which seals the pump from the drive shaft. The Lee disclosure contains no appreciation whatsoever for the diameter ratios between the shroud or shrouds and the auxiliary vanes. Moreover, FIG. 1 of Lee demonstrates that the auxiliary vanes (9, 10) as shown have a diameter dimension that is 96% that of the diameter of the shrouds. Lee fails to establish a *prima facie* case of obviousness since Lee fails to provide any motivation for providing a dimensional ratio where the diameter of the auxiliary vanes is from 65% to 95% the diameter of the shrouds. Lee provides no reasonable expectation of the

success of providing such structure inasmuch as Lee does not even acknowledge or appreciate the significance of providing a dimensional ratio as claimed. Therefore, claims 14-16, and added claim 26, are not obviated by Lee.

**CONCLUSION**

In view of the amendments made and arguments presented, the Applicants submit that claims 1, 4-7 and 12-26 present patentable subject matter. Reconsideration and allowance are respectfully requested.

Respectfully submitted,



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Attachments: Substitute Specification (Marked up version)  
Substitute Specification (Clean version)  
Replacement Drawing Sheets of FIGS. 1, 2, 3, 4, and 6  
Added Drawing Sheets of FIGS. 10 and 11  
Declaration of Craig I. Walker, with attached Exhibits A-G